



New Bedford
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726961

PROJECT FOR
PERFORMANCE OF
REMEDIAL RESPONSE ACTIVITIES AT
UNCONTROLLED HAZARDOUS
SUBSTANCE FACILITIES—ZONE 1

NUS CORPORATION
SUPERFUND DIVISION

D-583-5-3-9

FIELD INVESTIGATION
OF
ACUSHNET COMPANY
NEW BEDFORD, MASSACHUSETTS

FINAL REPORT

PREPARED UNDER

TECHNICAL DIRECTIVE DOCUMENT NO. F1-8302-01
NUS JOB NO. 3200
CONTRACT NO. 68-01-6699

FOR THE
REGION I
U.S. ENVIRONMENTAL PROTECTION AGENCY
SITE RESPONSE SECTION

December 2, 1983

NUS CORPORATION
SUPERFUND DIVISION

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EXECUTIVE SUMMARY

NUS/FIT conducted sampling of surface soil, river sediments, and surface water at Acushnet Company, New Bedford, Massachusetts. The findings are summarized as follows:

- Analysis of soil and sediment samples for PCBs has revealed the presence of Aroclors 1242 and 1254.
- The most highly contaminated area investigated, appeared to be a partially impounded area containing Acushnet River sediments. This assessment was made based upon the results of PCB and metals analysis.
- There is lesser contamination of the property directly adjacent to the Acushnet Company manufacturing plant. Contaminants identified include lead and Aroclor 1254.

1.0 INTRODUCTION

1.1 Summary Of FIT Involvement

NUS/FIT was tasked in February, 1983 to conduct sampling at three locations bordering the Acushnet River in New Bedford, Massachusetts. In addition, NUS/FIT was tasked to map industrial properties bordering New Bedford Harbor. In partial fulfillment of Technical Directive Document (TDD) 8302-01 (Appendix C) issued by EPA, NUS is submitting a report which summarizes sampling activities at the Acushnet Company, New Bedford, Massachusetts.

1.2 Scope Of Work

The purpose of this investigation was to conduct sampling and analysis of surface samples at the Acushnet Company for polychlorinated biphenyls (PCBs) and metals. Sampling was to take place around the Acushnet Company manufacturing plant and from intertidal sediments bordering the Acushnet River. A water sample was to be collected if any pipes were found discharging effluent into the river.

2.0 ACUSHNET COMPANY INVESTIGATION

On March 10, 1983, NUS/FIT conducted sampling activities at the Acushnet Company, Rubber Division, New Bedford, Massachusetts (see Figure 1). On the day of sampling, ambient air temperature was 35° to 45° F with intermittent precipitation. Five grab soil samples, three intertidal samples, and one water sample were obtained (see Figure 2). Soil samples were taken from the top six inches of surficial soil with a stainless steel trowel and placed in glass 8 oz. wide mouth containers. The trowel was decontaminated between each sample with an Alcanox wash, water rinse, methanol rinse, water rinse. The water sample for organics analysis was collected in two 1/2 gallon amber glass containers. The water sample for heavy metals analysis was collected in two 1-pint polyethylene containers.

2.1 Soil Samples

The surficial soil samples were obtained from five locations around the Acushnet Co., manufacturing plant (see Figure 2). Three of these samples were collected from an area between the property fence and the south parking lot. These samples were designated A₂, A₃, and A₄. The remaining soil samples (A₁, A₆) were collected adjacent to the Acushnet manufacturing plant along the north wall at the east corner and along the east wall respectively. Sample C₄ represents a soil blank taken from Bedford, Massachusetts.

2.2 Intertidal Samples

Three intertidal samples were collected from the Acushnet Co. vicinity (see Figure 2). Sample A₇ represented a surficial sample from the shoreline adjacent to the manufacturing plant. This sample was collected from the harbor-shore interface. Samples A₈ and A₉ represent intertidal sediment samples collected from an area which is enclosed on three sides by the shoreline, a breakwater, and an outcropping of land which extends into the Acushnet River. This partially enclosed area contained an abundance of silty organic harbor sediments, the consistency of which contrasted the gravel-like nature of

the shoreline to the immediate north of this area. Sample A8 was collected approximately 20' off-shore and A9 was collected opposite the end of a surface drain-pipe. Examination of the drain-pipe revealed that the interior-bottom of the pipe had completely corroded. Therefore, current drainage was now taking place posterior to the physical opening of the pipe. The sediment sample (A9) was collected directly opposite the outer-most portion of the pipe (not where current drainage was observed).

2.3 Water Sample

The area adjacent to the surface drainage pipe (see Figure 2) contained two pipes located below the surface of the water. Turbulence was observed at the outlet of the southernmost submerged pipe. The water sample, AW10, was collected approximately 1 foot below the water surface at the approximate outlet of this pipe. A second submerged pipe which exhibited no visual evidence of discharge was not sampled as the EPA Project Manager requested samples only be taken from pipes which were actively discharging effluent.



HADLEY ST.

BLACK TOP

XA1

ACUSHNET CO., MANUFACTURING
PLANT

XA6

XA7

TOWER

XA2

BLACK TOP

XA3

XA4

SURFACE
DRAIN PIPE

XA8

A9

SUBSURFACE
DRAIN PIPE

AW
10

BELLEVILLE AVE.

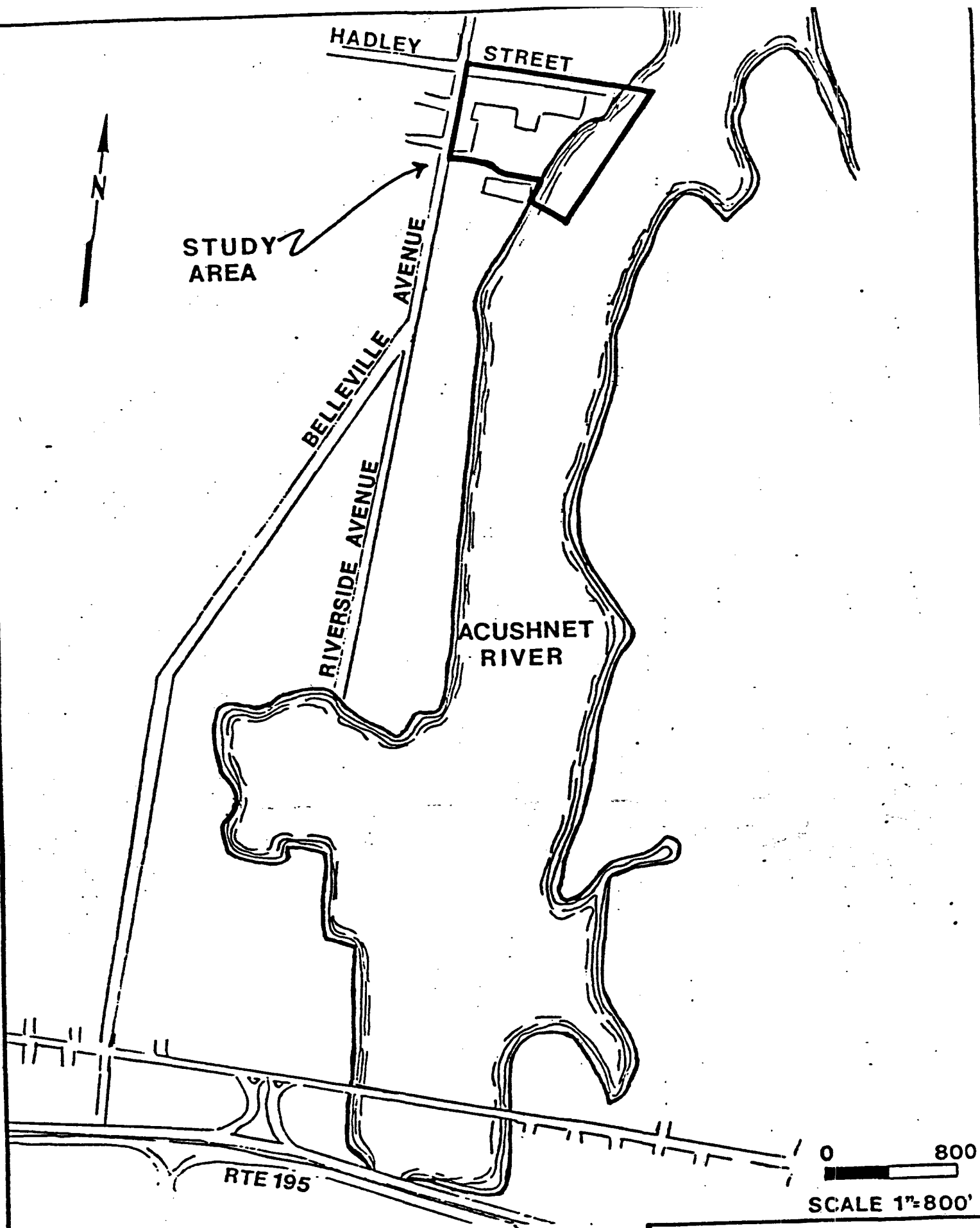
KEY

--- FENCE
X
A1 SAMPLE LOCATION

-- DRAWING NOT TO SCALE--

SAMPLING LOCATIONS
ACUSHNET COMPANY





3.0 RESULTS

3.1 PCB Analyses

The results of PCB analysis on the soil and water samples are presented in Table 1. The results are presented both on a wet and dry weight basis for comparison of in situ levels and comparison of dry-weight levels. Also, detection limits are reported on a wet-weight basis. The analyses suggest that Aroclors 1242 and 1254 were the predominant mixtures present at this site. The highest total PCB levels were found in New Bedford Harbor sediments taken from the area which is partially enclosed and contains the drain-pipes (Figure 2). Of the two harbor sediment samples taken at this location, the highest PCB levels were found in the sample taken opposite the end of the surface drain-pipe (sample A9). Aroclor 1242 was present at levels twice that of Aroclor 1254 at this location. The combined PCB concentration at sample location A9 on a dry weight basis was 1220 ppm. Sample A8, collected slightly north-east of A9, also exhibited approximately the same ratio of Aroclor 1242 to 1254 (2:1), and contained a total PCB concentration of 598 ppm (dry weight). The water sample had non-detectable levels of PCB (1 mcg/L detection limit). A sample taken from the shore line north of the partially impounded area exhibited levels of Aroclor 1254 which could not be accurately quantified. This sample also differed physically from the intertidal samples A8 and A9, apparently containing much less organic material than A8 and A9 and having a sand-like consistency (see Table 2).

The soil samples taken from around the Acushnet Co., manufacturing plant showed detectable levels of Aroclor 1254 only. The PCB levels associated with sampling locations directly adjacent to the plant (sample locations A6 and A1) were higher than those located away from the plant (sediment samples excluded). Sampling locations A1 and A6 exhibited Aroclor 1254 levels of 19 and 30 ppm, dry weight. Aroclor 1254 was identified in three samples taken from a grassy area on the south side of the plant, however, two of these samples were at levels below contractual detection limits, the third sample was reported to contain 3.0 ppm Aroclor 1254 (dry weight).

TABLE 1
SUMMARY OF PCB ANALYSES

STA	LAB ID	%M	Concentration PCB, ppm			
			WET		DRY	
			Aroclor 1242	Aroclor 1254	Aroclor 1242	Aroclor 1254
A1	A 1401	17.9	ND ¹	16	ND	19
A2	A 1395	10.4	ND ¹	0.4 ^a	ND	0.4 ^a
A3	A 1398	17.1	ND ¹	0.3 ^a	ND	0.4 ^a
A4	A 1394	22.3	ND ¹	2.3	ND	3.0
A6	A 1400	17.6	ND ²	25	ND	30
A7	A 1399	16.2	ND ²	11 ^a	ND	13.2 ^a
A8	A 1397	63.2	160	60	435	163
A9	A 1396	50.0	410	200	820	400
AW10*	A 1393	---	ND ³	ND ³	---	---
C4	A 1405	10.2	ND ¹	ND ¹	ND	ND

*AW10 - surface water sample
STA - station number

LAB ID - contract lab sample identification number
of detection

%M - moisture content of sample, percent

WET - concentration, wet weight basis

DRY - concentration, dry weight basis

ND - not detectable
1 at 0.2 ppm limit
of detection

2 at 5.0 ppm limit

3 at 1 mcg/L level
of detection

a - detected below GC/MS
contractual detection
limit

TABLE 2. SAMPLE DESCRIPTION

STA	DESCRIPTION
A1	brown fine to coarse SAND, trace fine cobble, trace organic material
A2	brown fine to coarse SAND, trace silt
A3	brown fine SAND, trace fine gravel
A4	black fine SAND
A6	brown fine to medium SAND, some silt, trace coarse sand, organic material
A7	brown fine to medium SAND
A8	black, wet, PEAT
A9	black, wet PEAT and silt
AW10	water sample
C4	soil blank, Bedford, Massachusetts

3.2 Metals Analyses

The results of the metals analysis are presented in Table 3 and are on a wet weight basis.

From Table 3 it can be seen that the lead levels in the Acushnet Co. samples appear elevated over the Bedford, Massachusetts soil blanks. The highest lead levels were found in the New Bedford Harbor sediment samples taken from the partially impounded area containing the drain-pipes (Figure 2). These locations (A8 and A9) exhibited lead levels of 830 and 630 ppm respectively (wet-weight). Chromium levels also appeared elevated at these two locations being 313 and 108 ppm (wet weight) respectively. See Table 3 for reported levels of other metals.

The results of the surface water analyses can be found in Table 3. The water sample was collected at the outlet of an actively discharging submerged drain pipe.

TABLE 3. SUMMARY OF METALS ANALYSES

Concentration * at Location

<u>Metal</u>	<u>A1</u>	<u>A2</u>	<u>A3</u>	<u>A4</u>	<u>A6</u>	<u>A7</u>	<u>A8</u>	<u>A9</u>	<u>AW10⁺</u>	<u>C4</u>
Al	2420	7310	2200	3050	2900	54.6	4460	4580	200 ⁺	4310
Ba	15	15	10	115	65	0.5	65	240	ND	10
Be	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
B	ND	ND	ND	ND	ND	0.1	10	10	700 ⁺	ND
Cr	4.5	23	3	7.5	14	0.18	313	108	ND	5.5
Co	ND	5	ND	ND	ND	ND	2.5	ND	ND	ND
Cu	30	10	7.5	42.5	45	1.65	568	433	ND	5
Fe	3850	14600	2690	4370	4380	5920	9290	10,400	500 ⁺	4080
Mn	101	307	57.7	61.5	103	4.0	63.7	67.5	30 ⁺	42
Ni	8	14	10	6	12	0.160	46.0	26	ND	4
Ag	ND	ND	ND	ND	ND	ND	1.0	2.5	ND	ND
V	40	30	20	20	30	0.2	70	50	ND	ND
Zn	42.5	47	12	101	87.5	1.77	1280	801	70	8.5
Sb	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
As	1.5	4.5	1	3.5	1.5	7	4	5	ND	4.5
Cd	0.2	0.05	0.25	0.35	0.4	0.1	28	4	ND	ND
Pb	144	14.5	83	168	278	212	830	630	75 ^{a+}	4.8 ^a
Hg	ND	0.1	ND	ND	ND	ND	0.4	0.3	ND	ND
Se	ND	ND	ND	0.6	ND	ND	ND	ND	ND	ND
Tl	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Sn	3	ND	1	ND	3	1	8	1	^b	ND

* values in ppm, on a wet weight basis

a analyzed by standard additions method, however not EPA protocol

b interference

ND not detected

+ values in mcg/L (ppb)

4.0 SAMPLE HANDLING

4.1 Sample Splits

On March 8, 1983, NUS/FIT contacted the Acushnet Company by phone to obtain permission for site access. At this time, NUS also offered splits of all samples which would be taken. E. Labonte of Acushnet Company refused the offer of sample splits at this time. On March 10, 1983, the day of the sampling activity, NUS again made an offer of sample splits which was also declined by E. Labonte of Acushnet Company.

4.2 Chain Of Custody

Chain of custody was maintained and documented on an EPA CHAIN OF CUSTODY RECORD. Collection of the samples was documented on CHAIN OF CUSTODY RECORD No. 0185. The samples were relinquished by Gregory Roscoe of NUS/FIT on March 14, 1983 to Gerard Porter, NUS/FIT. At this time, the samples for organics analysis were transferred to CHAIN OF CUSTODY RECORD No. 0186 and the samples for metals analysis were transferred to CHAIN OF CUSTODY RECORD No. 0187. Samples were shipped on March 14, 1983, and received by the respective analyzing laboratories on March 15, 1983. The chain of custody documents are maintained in the NUS/FIT project file.

4.3 Storage Conditions

Samples were maintained on ice from the day of sampling to the day of shipment to the contract laboratories. The one pint polyethylene bottles with water samples for metals analysis were preserved with approximately 0.7 ml concentrated HNO_3 each. On the day of sample shipment to the contract labs, the water sample for PCB analysis was placed on ice in the shipment cooler. According to the sample log-in sheet for West Coast Technical Service, Inc., all samples were received cold and intact. The samples for PCB analysis were extracted either on March 16 or March 21, 1983, and samples for metals analysis were analyzed April 11, 1983.

4.4 Analysis And Quality Control

The samples were analyzed under the EPA's National Contract Laboratory Program, Case Number 1569. The PCB analyses were conducted by West Coast Technical Service, Inc. of Cerritos, California. The metals analyses were conducted by Versar Inc. of Springfield, Virginia.

Mr. Arthur Clark of the EPA New England Regional laboratory (NERL) in Lexington, Massachusetts conducted a preliminary review of the analytical results for this investigation. Copies of the analysis data sheets can be found in Appendix A and B. According to A. Clark, the identification of the PCB mixtures appeared correct; however, a check on the quantitation of complex PCBs could not be conducted without more information and is often a matter of judgement on the part of the analyst. It was also noted that the low level PCB analyses had high spike recoveries which were outside the quality control limits.

Several comments were made by A. Clark regarding the metals analysis. The spike recoveries for lead, selenium, thallium and tin were quite low. This may indicate there is something in the soil which is binding these metals up or interfering with their analysis. In addition, several lead determinations were made using a standard additions procedure which was not EPA protocol.

Other quality control information is maintained in the NUS/FIT Project File for New Bedford Harbor.

5.0 SUMMARY AND DISCUSSION

A field investigation was conducted on March 10, 1983, at the Acushnet, Co., New Bedford, Massachusetts. Surface grab samples from the soil and adjacent harbor area have been analyzed under the National Contract Laboratory program and have been reported to contain the PCB mixtures Aroclor 1242 and 1254 and metals including lead and chromium.

The highest PCB concentrations were found in New Bedford Harbor intertidal sediment at sampling locations A8 and A9 (see Figure 2). This area included three drainage pipes, two of which were submerged. A grab soil sample from sediment adjacent to the end of the surface drain-pipe (sample location A9) was reported to contain a total PCB concentration of 1220 ppm (dry-weight). Another grab sample taken from these sediments slightly north-east of A9 (sample location A8) was reported to contain a total PCB concentration of 598 ppm (dry-weight). Soil samples taken from areas bordering the Acushnet Company manufacturing plant have total PCB levels ranging from detectable to 30 ppm (dry-weight)

Metals analysis shows a variety of metals present in both soil and sediment samples with high levels of lead being detected at several sampling locations including the intertidal sediments which also contained high chromium levels.

The water sample collected from the southernmost submerged drain-pipe had non-detectable levels of PCBs. Metals analysis indicated lead levels of 75 ppb and a boron concentration of 700 ppb. Turbulence at the outlet of this pipe indicated that drainage was active at this location.

From the limited sampling data available for this site, it appears that the intertidal zone, which is partially impounded, is the most highly contaminated area identified. This assessment is based upon analysis of surface samples for metals and PCBs. Lesser contamination is present in surficial areas directly adjacent to the Acushnet Co. manufacturing plant.

APPENDIX A

Case #/SAS #: 1569/439A
Date Rec'd: 3/15/83

Laboratory: WCTS, Inc.
Contract #: SAS# 439A

Sample #: METHOD BLANK
% Moisture: N/A

Organics Analysis Data Sheet

Level/Matrix: _____
QC Report #: _____
Spl→Extract: _____
Lab Std ID: NO SAMPLE
Lab ID: _____
Date Analyzed: _____
Circle Units: ug/Kg, ug/L

Level/Matrix: MEDIUM SOIL
QC Report #: SAS# 439A-3
Spl→Extract: BASED ON 0.2g→10ml
Lab Std ID: 8882-94
Lab ID: 8883-96
Date Extracted: 3/16/83
Date Analyzed: 3/29/83
Circle Units: (ug/Kg) ug/L

Volatile Compounds

2V	acrolein	NA
3V	acrylonitrile	
4V	benzene	
6V	carbon tetrachloride	
7V	chlorobenzene	
10V	1,2-dichloroethane	
11V	1,1,1-trichloroethane	
13V	1,1-dichloroethane	
14V	1,1,2-trichloroethane	
15V	1,1,2,2-tetrachloroethane	
16V	chloroethane	
17V	bis(chloromethyl)ether	
19V	2-chloroethylvinyl ether	
23V	chloroform	
29V	1,1-dichloroethylene	
30V	1,2-trans-dichloroethylene	
32V	1,2-dichloropropane	
33V	1,3-dichloropropane	
38V	ethylbenzene	
44V	methylene chloride	
45V	methyl chloride	
46V	methyl bromide	
47V	bromoform	
48V	dichlorobromomethane	
49V	trichlorofluoromethane	
50V	dichlorodifluoromethane	
51V	chlorodibromomethane	
85V	tetrachloroethylene	
86V	toluene	
87V	trichloroethylene	
88V	vinyl chloride	V

Pesticides

89P	aldrin	NA
90P	dieldrin	
91P	chlordan	
92P	4,4'-DDT	
93P	4,4'-DDE	
94P	4,4'-DDD	
95P	alpha-endosulfan	
96P	beta-endosulfan	
97P	endosulfan sulfate	
98P	endrin	
99P	endrin aldehyde	
100P	heptachlor	
101P	heptachlor epoxide	
102P	alpha-BHC	
103P	beta-BHC	
104P	gamma-BHC	
105P	delta-BHC	V
106P	PCB-1242	5000U
107P	PCB-1254	
108P	PCB-1221	
109P	PCB-1232	
110P	PCB-1248	
111P	PCB-1260	
112P	PCB-1016	
113P	toxaphene	V

U- Analyzed for but not detected

K- Detected below quantitation limit

** Detected below GC/MS detection limit

Case #/SAS #: 1569/439A
Date Rec'd: 3/15/83

Laboratory: WCTS, Inc.
Contract #: SAS#439A

Sample #: METHOD BLANK
% Moisture: N/A

Organics Analysis Data Sheet

Level/Matrix: _____
QC Report #: _____
Spl→Extract: _____
Lab Std ID: NO SAMPLE
Lab ID: _____
Date Analyzed: _____
Circle Units: ug/Kg, ug/L

Volatile Compounds

2V	acrolein	N/A
3V	acrylonitrile	
4V	benzene	
6V	carbon tetrachloride	
7V	chlorobenzene	
10V	1,2-dichloroethane	
11V	1,1,1-trichloroethane	
13V	1,1-dichloroethane	
14V	1,1,2-trichloroethane	
15V	1,1,2,2-tetrachloroethane	
16V	chloroethane	
17V	bis(chloromethyl)ether	
19V	2-chloroethylvinyl ether	
23V	chloroform	
29V	1,1-dichloroethylene	
30V	1,2-trans-dichloroethylene	
32V	1,2-dichloropropane	
33V	1,3-dichloropropane	
38V	ethylbenzene	
44V	methylene chloride	
45V	methyl chloride	
46V	methyl bromide	
47V	bromoform	
48V	dichlorobromomethane	
49V	trichlorofluoromethane	
50V	dichlorodifluoromethane	
51V	chlorodibromomethane	
85V	tetrachloroethylene	
86V	toluene	
87V	trichloroethylene	
88V	vinyl chloride	✓

Level/Matrix: MEDIUM SOIL
QC Report #: SAS#439A-3
Spl→Extract: BASED ON 0.2g→10mLs
Lab Std ID: 8882-94
Lab ID: 8883-97
Date Extracted: 3/21/83
Date Analyzed: 3/29/83
Circle Units: ug/Kg, ug/L

Pesticides

89P	aldrin	N/A
90P	dieldrin	
91P	chlordan	
92P	4,4'-DDT	
93P	4,4'-DDE	
94P	4,4'-DDD	
95P	alpha-endosulfan	
96P	beta-endosulfan	
97P	endosulfan sulfate	
98P	endrin	
99P	endrin aldehyde	
100P	heptachlor	
101P	heptachlor epoxide	
102P	alpha-BHC	
103P	beta-BHC	
104P	gamma-BHC	
105P	delta-BHC	✓
106P	PCB-1242	5000U
107P	PCB-1254	
108P	PCB-1221	
109P	PCB-1232	
110P	PCB-1248	
111P	PCB-1260	
112P	PCB-1016	
113P	toxaphene	✓

U- Analyzed for but not detected

K- Detected below quantitation limit

** Detected below GC/MS detection limit

Case #/SAS #: 1569/439A
Date Rec'd: 3/15/83

Laboratory: WCTS, Inc.
Contract #: SAS#439A

Sample #: METHOD BLANK
% Moisture: NA

Organics Analysis Data Sheet

Level/Matrix: _____
QC Report #: _____
Spl→Extract: _____
Lab Std ID: NO SAMPLE
Lab ID: _____
Date Analyzed: _____
Circle Units: ug/Kg, ug/L

Level/Matrix: LOW SOIL
QC Report #: SAS#439A-2
Spl→Extract: BASED ON 5.0g → 10ml/s
Lab Std ID: 8882-94
Lab ID: 8883-98
Date Extracted: 3/21/83
Date Analyzed: 3/29/83
Circle Units: ug/Kg ug/L

Volatile Compounds

Pesticides

2V	acrolein	NA
3V	acrylonitrile	
4V	benzene	
6V	carbon tetrachloride	
7V	chlorobenzene	
10V	1,2-dichloroethane	
11V	1,1,1-trichloroethane	
13V	1,1-dichloroethane	
14V	1,1,2-trichloroethane	
15V	1,1,2,2-tetrachloroethane	
16V	chloroethane	
17V	bis(chloromethyl)ether	
19V	2-chloroethylvinyl ether	
23V	chloroform	
29V	1,1-dichloroethylene	
30V	1,2-trans-dichloroethylene	
32V	1,2-dichloropropane	
33V	1,3-dichloropropane	
38V	ethylbenzene	
44V	methylene chloride	
45V	methyl chloride	
46V	methyl bromide	
47V	bromoform	
48V	dichlorobromomethane	
49V	trichlorofluoromethane	
50V	dichlorodifluoromethane	
51V	chlorodibromomethane	
85V	tetrachloroethylene	
86V	toluene	
87V	trichloroethylene	
88V	vinyl chloride	↓

89P	aldrin	NA
90P	dieldrin	
91P	chlordan	
92P	4,4'-DDT	
93P	4,4'-DDE	
94P	4,4'-DDD	
95P	alpha-endosulfan	
96P	beta-endosulfan	
97P	endosulfan sulfate	
98P	endrin	
99P	endrin aldehyde	
100P	heptachlor	
101P	heptachlor epoxide	
102P	alpha-BHC	
103P	beta-BHC	
104P	gamma-BHC	
105P	delta-BHC	
106P	PCB-1242	200u
107P	PCB-1254	
108P	PCB-1221	
109P	PCB-1232	
110P	PCB-1248	
111P	PCB-1260	
112P	PCB-1016	
113P	toxaphene	Y

U- Analyzed for but not detected

K- Detected below quantitation limit

** Detected below GC/MS detection limit

Case #/SAS #: 1569/439A
Date Rec'd: 3/15/83

Laboratory: WCTS, Inc.
Contract #: SAS#439A

Sample #: A1394
% Moisture: 22.3%

Organics Analysis Data Sheet

Level/Matrix: _____
QC Report #: _____
Spl→Extract: _____
Lab Std ID: NO SAMPLE
Lab ID: _____
Date Analyzed: _____
Circle Units: ug/Kg, ug/L

Level/Matrix: LOW SOIL
QC Report #: SAS#439A-2
Spl→Extract: 5.04g → 10mls
Lab Std ID: 8892-131
Lab ID: 8893-132
Date Extracted: 3/21/83
Date Analyzed: 3/31/83
Circle Units: ug/Kg, ug/L

Volatile Compounds

2V	acrolein	NA
3V	acrylonitrile	
4V	benzene	
6V	carbon tetrachloride	
7V	chlorobenzene	
10V	1,2-dichloroethane	
11V	1,1,1-trichloroethane	
13V	1,1-dichloroethane	
14V	1,1,2-trichloroethane	
15V	1,1,2,2-tetrachloroethane	
16V	chloroethane	
17V	bis(chloromethyl)ether	
19V	2-chloroethylvinyl ether	
23V	chloroform	
29V	1,1-dichloroethylene	
30V	1,2-trans-dichloroethylene	
32V	1,2-dichloropropane	
33V	1,3-dichloropropane	
38V	ethylbenzene	
44V	methylene chloride	
45V	methyl chloride	
46V	methyl bromide	
47V	bromoform	
48V	dichlorobromomethane	
49V	trichlorofluoromethane	
50V	dichlorodifluoromethane	
51V	chlorodibromomethane	
85V	tetrachloroethylene	
86V	toluene	
87V	trichloroethylene	
88V	vinyl chloride	

Pesticides	
89P	aldrin NA
90P	dieldrin
91P	chlordan
92P	4,4'-DDT
93P	4,4'-DDE
94P	4,4'-DDD
95P	alpha-endosulfan
96P	beta-endosulfan
97P	endosulfan sulfate
98P	endrin
99P	endrin aldehyde
100P	heptachlor
101P	heptachlor epoxide
102P	alpha-BHC
103P	beta-BHC
104P	gamma-BHC
105P	delta-BHC
106P	PCB-1242 200u
107P	PCB-1254 2300
108P	PCB-1221 200u
109P	PCB-1232
110P	PCB-1248
111P	PCB-1260
112P	PCB-1016
113P	toxaphene

U - Analyzed for but not detected

K - Detected below quantitation limit

** Detected below GC/MS detection limit

Case #/SAS #: 1569/439
Date Rec'd: 3/15/83

Laboratory: WCTS, Inc.
Contract #: SAS#439A

Sample #: A1395
% Moisture: 10.4%

Organics Analysis Data Sheet

Level/Matrix: _____
QC Report #: _____
Spl→Extract: _____
Lab Std ID: NO SAMPLE
Lab ID: _____
Date Analyzed: _____
Circle Units: ug/Kg, ug/L

Volatile Compounds

2V	acrolein	NA
3V	acrylonitrile	
4V	benzene	
6V	carbon tetrachloride	
7V	chlorobenzene	
10V	1,2-dichloroethane	
11V	1,1,1-trichloroethane	
13V	1,1-dichloroethane	
14V	1,1,2-trichloroethane	
15V	1,1,2,2-tetrachloroethane	
16V	chloroethane	
17V	bis(chloromethyl)ether	
19V	2-chloroethylvinyl ether	
23V	chloroform	
29V	1,1-dichloroethylene	
30V	1,2-trans-dichloroethylene	
32V	1,2-dichloropropane	
33V	1,3-dichloropropane	
38V	ethylbenzene	
44V	methylene chloride	
45V	methyl chloride	
46V	methyl bromide	
47V	bromoform	
48V	dichlorobromomethane	
49V	trichlorofluoromethane	
50V	dichlorodifluoromethane	
51V	chlorodibromomethane	
85V	tetrachloroethylene	
86V	toluene	
87V	trichloroethylene	
88V	vinyl chloride	↓

Level/Matrix: LOW SOIL
QC Report #: SAS#439A-2
Spl→Extract: 5.0g→10mls
Lab Std ID: 8882-94
Lab ID: 8883-99
Date Extracted: 3/21/83
Date Analyzed: 3/29/83
Circle Units: ug/Kg, ug/L

Pesticides

89P	aldrin	NA
90P	dieldrin	
91P	chlordan	
92P	4,4'-DDT	
93P	4,4'-DDE	
94P	4,4'-DDD	
95P	alpha-endosulfan	
96P	beta-endosulfan	
97P	endosulfan sulfate	
98P	endrin	
99P	endrin aldehyde	
100P	heptachlor	
101P	heptachlor epoxide	
102P	alpha-BHC	
103P	beta-BHC	
104P	gamma-BHC	
105P	delta-BHC	
106P	PCB-1242	200U
107P	PCB-1254	400**
108P	PCB-1221	200U
109P	PCB-1232	
110P	PCB-1248	
111P	PCB-1260	
112P	PCB-1016	
113P	toxaphene	↓

U- Analyzed for but not detected

K- Detected below quantitation limit

** Detected below GC/MS detection limit

Case #/SAS #: 1569/439A
Date Rec'd: 3/15/83

Laboratory: WCTS, Inc.
Contract #: SAS*439A

Sample #: A1396
% Moisture: 50.0%

Organics Analysis Data Sheet

Level/Matrix: _____
QC Report #: _____
Spl→Extract: _____
Lab Std ID: NO SAME
Lab ID: _____
Date Analyzed: _____
Circle Units: ug/Kg, ug/L

Volatile Compounds

Level/Matrix: MEDIUM SOIL
QC Report #: SAS*439A-3
Spl→Extract: 0.202g → 10mls
Lab Std ID: 8884-125
Lab ID: 8885-127
Date Extracted: 3/16/83
Date Analyzed: 3/30/83
Circle Units: ug/Kg, ug/L

2V	acrolein	NA
3V	acrylonitrile	
4V	benzene	
6V	carbon tetrachloride	
7V	chlorobenzene	
10V	1,2-dichloroethane	
11V	1,1,1-trichloroethane	
13V	1,1-dichloroethane	
14V	1,1,2-trichloroethane	
15V	1,1,2,2-tetrachloroethane	
16V	chloroethane	
17V	bis(chloromethyl)ether	
19V	2-chloroethylvinyl ether	
23V	chloroform	
29V	1,1-dichloroethylene	
30V	1,2-trans-dichloroethylene	
32V	1,2-dichloropropane	
33V	1,3-dichloropropane	
38V	ethylbenzene	
44V	methylene chloride	
45V	methyl chloride	
46V	methyl bromide	
47V	bromoform	
48V	dichlorobromomethane	
49V	trichlorofluoromethane	
50V	dichlorodifluoromethane	
51V	chlorodibromomethane	
85V	tetrachloroethylene	
86V	toluene	
87V	trichloroethylene	
88V	vinyl chloride	V

Pesticides	
89P	aldrin NA
90P	dieldrin
91P	chlordan
92P	4,4'-DDT
93P	4,4'-DDE
94P	4,4'-DDD
95P	alpha-endosulfan
96P	beta-endosulfan
97P	endosulfan sulfate
98P	endrin
99P	endrin aldehyde
100P	heptachlor
101P	heptachlor epoxide
102P	alpha-BHC
103P	beta-BHC
104P	gamma-BHC
105P	delta-BHC Y
106P	PCB-1242 410,000
107P	PCB-1254 200,000
108P	PCB-1221 5000L
109P	PCB-1232
110P	PCB-1248
111P	PCB-1260
112P	PCB-1016
113P	toxaphene Y

U- Analyzed for but not detected

K- Detected below quantitation limit

** Detected below GC/MS detection limit

Case #/SAS #: 1569/439A Laboratory: WCTS, Inc. Sample #: A1397
 Date Rec'd: 3/15/83 Contract #: SAS*439A % Moisture: 63.2%

Organics Analysis Data Sheet

Level/Matrix: _____
 QC Report #: _____
 Spl→Extract: _____
 Lab Std ID: NO SAMPLE
 Lab ID: _____
 Date Analyzed: _____
 Circle Units: ug/Kg, ug/L

Level/Matrix: MEDIUM SOIL
 QC Report #: SAS*439A-3
 Spl→Extract: 0.205g → 10mls
 Lab Std ID: 8884-113
 Lab ID: 8885-114
 Date Extracted: 3/16/83
 Date Analyzed: 3/30/83
 Circle Units: ug/Kg, ug/L

Volatile Compounds

2V	acrolein	<u>N/A</u>
3V	acrylonitrile	
4V	benzene	
6V	carbon tetrachloride	
7V	chlorobenzene	
10V	1,2-dichloroethane	
11V	1,1,1-trichloroethane	
13V	1,1-dichloroethane	
14V	1,1,2-trichloroethane	
15V	1,1,2,2-tetrachloroethane	
16V	chloroethane	
17V	bis(chloromethyl)ether	
19V	2-chloroethylvinyl ether	
23V	chloroform	
29V	1,1-dichloroethylene	
30V	1,2-trans-dichloroethylene	
32V	1,2-dichloropropane	
33V	1,3-dichloropropane	
38V	ethylbenzene	
44V	methylene chloride	
45V	methyl chloride	
46V	methyl bromide	
47V	bromoform	
48V	dichlorobromomethane	
49V	trichlorofluoromethane	
50V	dichlorodifluoromethane	
51V	chlorodibromomethane	
85V	tetrachloroethylene	
86V	toluene	
87V	trichloroethylene	
88V	vinyl chloride	<u>↓</u>

Pesticides

89P	aldrin	<u>N/A</u>
90P	dielddrin	
91P	chlordan	
92P	4,4'-DDT	
93P	4,4'-DDE	
94P	4,4'-DDD	
95P	alpha-endosulfan	
96P	beta-endosulfan	
97P	endosulfan sulfate	
98P	endrin	
99P	endrin aldehyde	
100P	heptachlor	
101P	heptachlor epoxide	
102P	alpha-BHC	
103P	beta-BHC	
104P	gamma-BHC	
105P	delta-BHC	<u>↓</u>
106P	PCB-1242	<u>160,000</u>
107P	PCB-1254	<u>60,000</u>
108P	PCB-1221	<u>5000 u</u>
109P	PCB-1232	
110P	PCB-1248	
111P	PCB-1260	
112P	PCB-1016	
113P	toxaphene	<u>↓</u>

U- Analyzed for but not detected

K- Detected below quantitation limit

** Detected below GC/MS detection limit

Case #/SAS #: 1569/439A
Date Rec'd: 3/15/83

Laboratory: WCTS, Inc.
Contract #: SAS-439A

Sample #: A1398
% Moisture: 17.1%

Organics Analysis Data Sheet

Level/Matrix: _____
QC Report #: _____
Spl→Extract: _____
Lab Std ID: NO SAMPLE
Lab ID: _____
Date Analyzed: _____
Circle Units: ug/Kg, ug/L

Level/Matrix: LOW SOIL
QC Report #: SAS-439A-2
Spl→Extract: 5.06g → 10mls
Lab Std ID: 8882-101
Lab ID: 8883-102
Date Extracted: 3/21/83
Date Analyzed: 3/29/83
Circle Units: ug/Kg, ug/L

Volatile Compounds

2V	acrolein	NA
3V	acrylonitrile	
4V	benzene	
6V	carbon tetrachloride	
7V	chlorobenzene	
10V	1,2-dichloroethane	
11V	1,1,1-trichloroethane	
13V	1,1-dichloroethane	
14V	1,1,2-trichloroethane	
15V	1,1,2,2-tetrachloroethane	
16V	chloroethane	
17V	bis(chloromethyl)ether	
19V	2-chloroethylvinyl ether	
23V	chloroform	
29V	1,1-dichloroethylene	
30V	1,2-trans-dichloroethylene	
32V	1,2-dichloropropane	
33V	1,3-dichloropropane	
38V	ethylbenzene	
44V	methylene chloride	
45V	methyl chloride	
46V	methyl bromide	
47V	bromoform	
48V	dichlorobromomethane	
49V	trichlorofluoromethane	
50V	dichlorodifluoromethane	
51V	chlorodibromomethane	
85V	tetrachloroethylene	
86V	toluene	
87V	trichloroethylene	
88V	vinyl chloride	Y

Pesticides

89P	aldrin	NA
90P	dieldrin	
91P	chlordane	
92P	4,4'-DDT	
93P	4,4'-DDE	
94P	4,4'-DDD	
95P	alpha-endosulfan	
96P	beta-endosulfan	
97P	endosulfan sulfate	
98P	endrin	
99P	endrin aldehyde	
100P	heptachlor	
101P	heptachlor epoxide	
102P	alpha-BHC	
103P	beta-BHC	
104P	gamma-BHC	
105P	delta-BHC	Y
106P	PCB-1242	200u
107P	PCB-1254	300**
108P	PCB-1221	200u
109P	PCB-1232	
110P	PCB-1248	
111P	PCB-1260	
112P	PCB-1016	
113P	toxaphene	Y

U- Analyzed for but not detected

K- Detected below quantitation limit

** Detected below GC/MS detection limit

Case #/SAS #: 1569/439A
Date Rec'd: 3/15/83

Laboratory: WCTS, Inc.
Contract #: SAS#439A

Sample #: A1399
% Moisture: 16.2%

Organics Analysis Data Sheet

Level/Matrix: _____
QC Report #: _____
Spl→Extract: _____
Lab Std ID: NO SAMPLE
Lab ID: _____
Date Analyzed: _____
Circle Units: ug/Kg, ug/L

Volatile Compounds

2V	acrolein	NA
3V	acrylonitrile	
4V	benzene	
6V	carbon tetrachloride	
7V	chlorobenzene	
10V	1,2-dichloroethane	
11V	1,1,1-trichloroethane	
13V	1,1-dichloroethane	
14V	1,1,2-trichloroethane	
15V	1,1,2,2-tetrachloroethane	
16V	chloroethane	
17V	bis(chloromethyl)ether	
19V	2-chloroethylvinyl ether	
23V	chloroform	
29V	1,1-dichloroethylene	
30V	1,2-trans-dichloroethylene	
32V	1,2-dichloropropane	
33V	1,3-dichloropropane	
38V	ethylbenzene	
44V	methylene chloride	
45V	methyl chloride	
46V	methyl bromide	
47V	bromoform	
48V	dichlorobromomethane	
49V	trichlorofluoromethane	
50V	dichlorodifluoromethane	
51V	chlorodibromomethane	
85V	tetrachloroethylene	
86V	toluene	
87V	trichloroethylene	
88V	vinyl chloride	Y

Level/Matrix: MEDIUM SOIL
QC Report #: SAS#439A-3
Spl→Extract: 0.203g → 10mls
Lab Std ID: 8884-113
Lab ID: 8885-115
Date Extracted: 3/16/83
Date Analyzed: 3/30/83
Circle Units: ug/Kg, ug/L

Pesticides

89P	aldrin	NA
90P	dieldrin	
91P	chlordane	
92P	4,4'-DDT	
93P	4,4'-DDE	
94P	4,4'-DDD	
95P	alpha-endosulfan	
96P	beta-endosulfan	
97P	endosulfan sulfate	
98P	endrin	
99P	endrin aldehyde	
100P	heptachlor	
101P	heptachlor epoxide	
102P	alpha-BHC	
103P	beta-BHC	
104P	gamma-BHC	
105P	delta-BHC	Y
106P	PCB-1242	5000u
107P	PCB-1254	11,000 *
108P	PCB-1221	5000u
109P	PCB-1232	
110P	PCB-1248	
111P	PCB-1260	
112P	PCB-1016	
113P	toxaphene	Y

U- Analyzed for but not detected

K- Detected below quantitation limit

** Detected below GC/MS detection limit

Case #/SAS #: 1569/439A
Date Rec'd: 3/15/83

Laboratory: WCTS, Inc.
Contract #: SAS#439A

Sample #: A1400
% Moisture: 17.6%

Organics Analysis Data Sheet

Level/Matrix: _____
QC Report #: _____
Spl→Extract: _____
Lab Std ID: NO SAMPLE
Lab ID: _____
Date Analyzed: _____
Circle Units: ug/Kg, ug/L

Volatile Compounds

2V	acrolein	NA
3V	acrylonitrile	
4V	benzene	
6V	carbon tetrachloride	
7V	chlorobenzene	
10V	1,2-dichloroethane	
11V	1,1,1-trichloroethane	
13V	1,1-dichloroethane	
14V	1,1,2-trichloroethane	
15V	1,1,2,2-tetrachloroethane	
16V	chloroethane	
17V	bis(chloromethyl)ether	
19V	2-chloroethylvinyl ether	
23V	chloroform	
29V	1,1-dichloroethylene	
30V	1,2-trans-dichloroethylene	
32V	1,2-dichloropropane	
33V	1,3-dichloropropane	
38V	ethylbenzene	
44V	methylene chloride	
45V	methyl chloride	
46V	methyl bromide	
47V	bromoform	
48V	dichlorobromomethane	
49V	trichlorofluoromethane	
50V	dichlorodifluoromethane	
51V	chlorodibromomethane	
85V	tetrachloroethylene	
86V	toluene	
87V	trichloroethylene	
88V	vinyl chloride	↓

Level/Matrix: MEDIUM SOIL
QC Report #: SAS#439A-3
Spl→Extract: 0.205g → 10mls
Lab Std ID: 8884-113
Lab ID: 8885-116
Date Extracted: 3/16/83
Date Analyzed: 3/30/83
Circle Units: ug/Kg, ug/L

Pesticides

89P	aldrin	NA
90P	dieldrin	
91P	chlordane	
92P	4,4'-DDT	
93P	4,4'-DDE	
94P	4,4'-DDD	
95P	alpha-endosulfan	
96P	beta-endosulfan	
97P	endosulfan sulfate	
98P	endrin	
99P	endrin aldehyde	
100P	heptachlor	
101P	heptachlor epoxide	
102P	alpha-BHC	
103P	beta-BHC	
104P	gamma-BHC	
105P	delta-BHC	↓
106P	PCB-1242	5000U
107P	PCB-1254	25000
108P	PCB-1221	5000U
109P	PCB-1232	
110P	PCB-1248	
111P	PCB-1260	
112P	PCB-1016	
113P	toxaphene	↓

U- Analyzed for but not detected

K- Detected below quantitation limit

** Detected below GC/MS detection limit

Case #/SAS #: 1569/439A
Date Rec'd: 3/15/83

Laboratory: WCTS, Inc.
Contract #: SAS#439A

Sample #: A1401
% Moisture: 17.9%

Organics Analysis Data Sheet

Level/Matrix: _____
QC Report #: _____
Spl→Extract: _____
Lab Std ID: NO SAMPLE
Lab ID: _____
Date Analyzed: _____
Circle Units: ug/Kg, ug/L

Volatile Compounds

2V	acrolein	NA
3V	acrylonitrile	
4V	benzene	
6V	carbon tetrachloride	
7V	chlorobenzene	
10V	1,2-dichloroethane	
11V	1,1,1-trichloroethane	
13V	1,1-dichloroethane	
14V	1,1,2-trichloroethane	
15V	1,1,2,2-tetrachloroethane	
16V	chloroethane	
17V	bis(chloromethyl)ether	
19V	2-chloroethylvinyl ether	
23V	chloroform	
29V	1,1-dichloroethylene	
30V	1,2-trans-dichloroethylene	
32V	1,2-dichloropropane	
33V	1,3-dichloropropane	
38V	ethylbenzene	
44V	methylene chloride	
45V	methyl chloride	
46V	methyl bromide	
47V	bromoform	
48V	dichlorobromomethane	
49V	trichlorofluoromethane	
50V	dichlorodifluoromethane	
51V	chlorodibromomethane	
85V	tetrachloroethylene	
86V	toluene	
87V	trichloroethylene	
88V	vinyl chloride	✓

Level/Matrix: LOW SOIL
QC Report #: SAS#439A-2
Spl→Extract: 5.18g → 10mls
Lab Std ID: 8884-125
Lab ID: 8885-129
Date Extracted: 3/21/83
Date Analyzed: 3/30/83
Circle Units: ug/Kg, ug/L

Pesticides

89P	aldrin	NA
90P	dieldrin	
91P	chlordane	
92P	4,4'-DDT	
93P	4,4'-DDE	
94P	4,4'-DDD	
95P	alpha-endosulfan	
96P	beta-endosulfan	
97P	endosulfan sulfate	
98P	endrin	
99P	endrin aldehyde	
100P	heptachlor	
101P	heptachlor epoxide	
102P	alpha-BHC	
103P	beta-BHC	
104P	gamma-BHC	
105P	delta-BHC	✓
106P	PCB-1242	200U
107P	PCB-1254	16,000
108P	PCB-1221	200U
109P	PCB-1232	
110P	PCB-1248	
111P	PCB-1260	
112P	PCB-1016	
113P	toxaphene	✓

U- Analyzed for but not detected

K- Detected below quantitation limit

** Detected below GC/MS detection limit

Case #/SAS #: 1569/439A
Date Rec'd: 3/15/83

Laboratory: WCTS, Inc.
Contract #: SAS#439A

Sample #: A1405
% Moisture: 10.2%

Organics Analysis Data Sheet

Level/Matrix: _____
QC Report #: _____
Spl→Extract: _____
Lab Std ID: NO SAMPLE
Lab ID: _____
Date Analyzed: _____
Circle Units: ug/Kg, ug/L

Volatile Compounds

2V	acrolein	NA
3V	acrylonitrile	
4V	benzene	
6V	carbon tetrachloride	
7V	chlorobenzene	
10V	1,2-dichloroethane	
11V	1,1,1-trichloroethane	
13V	1,1-dichloroethane	
14V	1,1,2-trichloroethane	
15V	1,1,2,2-tetrachloroethane	
16V	chloroethane	
17V	bis(chloromethyl)ether	
19V	2-chloroethylvinyl ether	
23V	chloroform	
29V	1,1-dichloroethylene	
30V	1,2-trans-dichloroethylene	
32V	1,2-dichloropropane	
33V	1,3-dichloropropane	
38V	ethylbenzene	
44V	methylene chloride	
45V	methyl chloride	
46V	methyl bromide	
47V	bromoform	
48V	dichlorobromomethane	
49V	trichlorofluoromethane	
50V	dichlorodifluoromethane	
51V	chlorodibromomethane	
85V	tetrachloroethylene	
86V	toluene	
87V	trichloroethylene	
88V	vinyl chloride	V

Level/Matrix: LOW SOIL
QC Report #: SAS#439A-2
Spl→Extract: 5.0g → 10mls
Lab Std ID: 8882-101
Lab ID: 8883-105
Date Extracted: 3/21/83
Date Analyzed: 3/29/83
Circle Units: (ug/Kg) ug/L

Pesticides

89P	aldrin	NA
90P	dieldrin	
91P	chlordan	
92P	4,4'-DDT	
93P	4,4'-DDE	
94P	4,4'-DDD	
95P	alpha-endosulfan	
96P	beta-endosulfan	
97P	endosulfan sulfate	
98P	endrin	
99P	endrin aldehyde	
100P	heptachlor	
101P	heptachlor epoxide	
102P	alpha-BHC	
103P	beta-BHC	
104P	gamma-BHC	
105P	delta-BHC	V
106P	PCB-1242	200u
107P	PCB-1254	
108P	PCB-1221	
109P	PCB-1232	
110P	PCB-1248	
111P	PCB-1260	
112P	PCB-1016	
113P	toxaphene	V

U- Analyzed for but not detected

K- Detected below quantitation limit

** Detected below GC/MS detection limit

Case 1569

PCB Confirmation by GCMS - Samples Analyzed 4/16/83

File Name	Sample#	Confirmation Status
25668P1	100ug/ml PCB 1254 Std	
25668P2	A1394	PCB 1254 Confirmed
25668P3	A1396	PCB's 1242 and 1254 Confirmed
25668P4	A1397	PCB's 1242 and 1254 Confirmed
25668P5	A1400	PCB 1254 Confirmed
25668P6	A1401	PCB 1254 Confirmed

APPENDIX B

APPENDIX B

4/12/83

Soils are on wet wt basis

SAMPLE MA 8951
A4

INORGANICS ANALYSIS DATA SHEET

LAB NAME VERSAR INC.
LAB SAMPLE # 9897

CASE 1569
QC REPORT 58

*Note units
Note re: on p. 5
Sr*

PROJECT-TASK 793.0000
BATCH NO. 58

TASK 1

MG/KG

MG/KG

ALUMINUM 3050.000
BARIUM 115.000
BERYLLIUM < 0.250
BORON < 5.000
CHROMIUM 7.500
COBALT < 2.500
COPPER 42.500

IRON 4370.000
MANGANESE 61.500
NICKEL 6.000
SILVER < 0.500
VANADIUM 20.000
ZINC 101.000

TASK 2

MG/KG

MG/KG

ANTIMONY < 1.
ARSENIC 3.5
CADMIUM 0.35
LEAD 106.

MERCURY < 0.1
SELENIUM 0.6
THALLIUM < 0.5
TIN < 1.

TASK 3

MG/KG

OIL AND GREASE
CYANIDE
PHENOLICS

COMMENTS

"C" - BLANK CORRECTED CONC.
"ND/B" - NOT DETECTED DUE TO BLANK
"S" - SAMPLES ANALYZED BY THE STD.
ADDITION METHOD.
WITH A DETECTION LIMIT OF

5. WITH A DETECTION LIMIT OF
6. WITH A DETECTION LIMIT OF
7. INSUFFICIENT SAMPLE ALIQUOT
8. INTERFERENCE

Robert Maxfield for RMI

ROBERT MAXFIELD, INORG. BRANCH MANAGER.

A2

INORGANICS ANALYSIS DATA SHEET

LAB NAME VERSAR INC.
LAB SAMPLE # 9898CASE 1569
CC REPORT 58PROJECT-TASK 793.0000
BATCH NO. 58

TASK 1

MG/KG

MG/KG

ALUMINUM 7310.000
BARIUM 15.000
BERYLLIUM < 0.250
BORON < 5.000
CHROMIUM 23.000
COBALT 5.000
COPPER 10.000IRON 14600.000
MANGANESE 307.000
NICKEL 14.000
SILVER < 0.500
VANADIUM 30.000
ZINC 47.000

TASK 2

MG/KG

MG/KG

ANTIMONY < 1.
ARSENIC 4.5
CADMIUM 0.05
LEAD 14.5 *MERCURY 0.1
SELENIUM < 0.1
THALLIUM < 0.5
TIN < 1.TASK 3
MG/KG

OIL AND GREASE

CYANIDE

PHENOLICS

* Inadvertently omitted - got it via phone. *on*

COMMENTS

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ADDITION METHOD.

WITH A DETECTION LIMIT OF

5. WITH A DETECTION LIMIT OF

6. WITH A DETECTION LIMIT OF

7. INSUFFICIENT SAMPLE ALIQUOT

8. INTERFERENCE

Robert Maxfield for RM
ROBERT MAXFIELD, INORG. BRANCH MANAGER.

A9

INORGANICS ANALYSIS DATA SHEET

LAB NAME VERSAR INC.
LAB SAMPLE # 9899CASE 1569
QC REPORT 58PROJECT-TASK 793.0000
BATCH NO. 58

TASK 1

MG/KG

MG/KG

ALUMINUM 4580.000
BARIUM 240.000
BERYLLIUM < 0.250
BORON 10.000
CHROMIUM 108.000
COBALT < 2.500
COPPER 433.000IRON 10400.000
MANGANESE 67.500
NICKEL 26.000
SILVER 2.500
VANADIUM 50.000
ZINC 801.000

TASK 2

MG/KG

MG/KG

ANTIMONY <1
ARSENIC 5.
CADMIUM 4.
LEAD 630.MERCURY 0.3
SELENIUM <0.1
THALLIUM <0.5
TIN 1.

TASK 3

MG/KG

OIL AND GREASE

CYANIDE

PHENOLICS

COMMENTS

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"ND/B" - NOT DETECTED DUE TO BLANK

"S" - SAMPLES ANALYZED BY THE STD.
ADDITION METHOD.

WITH A DETECTION LIMIT OF

5. WITH A DETECTION LIMIT OF

6. WITH A DETECTION LIMIT OF

7. INSUFFICIENT SAMPLE ALIQUOT

8. INTERFERENCE

W. N. N. for R.M.

ROBERT MAXFIELD, INORG. BRANCH MANAGER.

A8

INORGANICS ANALYSIS DATA SHEET

LAB NAME VERSAR INC.
LAB SAMPLE # 9900CASE 1569
QC REPORT 58PROJECT-TASK 793.0000
BATCH NO. 58

TASK 1

MG/KG

MG/KG

ALUMINUM 4460.000
BARIUM 65.000
BERYLLIUM < 0.250
BORON 10.000
CHROMIUM 313.000
COBALT 2.500
COPPER 568.000IRON 9290.000
MANGANESE 63.700
NICKEL 46.000
SILVER 1.000
VANADIUM 70.000
ZINC 1280.000

TASK 2

MG/KG

MG/KG

ANTIMONY < 1.
ARSENIC 4.
CADMIUM 28.
LEAD 830.MERCURY 0.4
SELENIUM < 0.1
THALLIUM < 0.5
TIN 8.

TASK 3

MG/KG

OIL AND GREASE

CYANIDE

PHENCLICS

COMMENTS

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"ND/B" - NOT DETECTED DUE TO BLANK
"S" - SAMPLES ANALYZED BY THE STD.
ADDITION METHOD.
WITH A DETECTION LIMIT OF5. WITH A DETECTION LIMIT OF
6. WITH A DETECTION LIMIT OF
7. INSUFFICIENT SAMPLE ALIQUOT
8. INTERFERENCEWilliam for RM
ROBERT MAXFIELD, INORG. BRANCH MANAGER.

A3

INORGANICS ANALYSIS DATA SHEET

LAB NAME VERSAR INC.
LAB SAMPLE # 9901CASE 1569
QC REPORT 58PROJECT-TASK 793.0000
BATCH NO. 58

TASK 1

MG/KG

MG/KG

ALUMINUM 2200.000
BARIUM 10.000
BERYLLIUM < 0.250
BORON < 5.000
CHROMIUM 3.000
COBALT < 2.500
COPPER 7.500

IRON 2690.000
MANGANESE 57.700
NICKEL 10.000
SILVER < 0.500
VANADIUM 20.000
ZINC 12.000

TASK 2

MG/KG

MG/KG

ANTIMONY < 1.
ARSENIC 1.
CADMIUM 0.25
LEAD 83.

MERCURY < 0.1
SELENIUM < 0.1
THALLIUM < 0.5
TIN 1.

TASK 3

MG/KG

OIL AND GREASE

CYANIDE

PHENOLICS

COMMENTS

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"ND/B" - NOT DETECTED DUE TO BLANK

"S" - SAMPLES ANALYZED BY THE STD.
ADDITION METHOD.

WITH A DETECTION LIMIT OF

5. WITH A DETECTION LIMIT OF

6. WITH A DETECTION LIMIT OF

7. INSUFFICIENT SAMPLE ALIQUOT

8. INTERFERENCE

WTN [signature] for R.M.
ROBERT MAXFIELD, INORG. BRANCH MANAGER.

INORGANICS ANALYSIS DATA SHEET

LAB NAME VERSAR INC.
LAB SAMPLE # 9902

CASE 1569
QC REPORT 58

PROJECT-TASK 793.0000
BATCH NO. 58

TASK 1

MG/KG

MG/KG

ALUMINUM 54.600
BARIUM 0.500
BERYLLIUM < 0.005
BORON 0.100
CHROMIUM 0.180
COBALT < 0.050
COPPER 1.650

IRON 5920.000
MANGANESE 4.000
NICKEL 0.160
SILVER < 0.010
VANADIUM 0.200
ZINC 1.770

TASK 2

MG/KG

MG/KG

ANTIMONY < 1.
ARSENIC 7.
CADMIUM 0.1
LEAD 212.

MERCURY < 0.1
SELENIUM < 0.1
THALLIUM < 0.5
TIN 1.

TASK 3

MG/KG

OIL AND GREASE

CYANIDE

PHENOLICS

COMMENTS

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"ND/B" - NOT DETECTED DUE TO BLANK

"S" - SAMPLES ANALYZED BY THE STD.
ADDITION METHOD.

WITH A DETECTION LIMIT OF

5. WITH A DETECTION LIMIT OF

6. WITH A DETECTION LIMIT OF

7. INSUFFICIENT SAMPLE ALIQUOT

8. INTERFERENCE

Robert Maxfield for RM

ROBERT MAXFIELD, INORG. BRANCH MANAGER.

4/12/83

SAMPLE MA 8957

AL

INORGANICS ANALYSIS DATA SHEET

LAB NAME VERSAR INC.
LAB SAMPLE # 9903

CASE 1569
QC REPORT 58

PROJECT-TASK 793.0000
BATCH NO. 58

TASK 1

MG/KG

MG/KG

ALUMINUM 2900.000
BARIUM 65.000
BERYLLIUM < 0.250
BORON < 5.000
CHROMIUM 14.000
COBALT < 2.500
COPPER 45.000

IRON 4380.000
MANGANESE 103.000
NICKEL 12.000
SILVER < 0.500
VANADIUM 30.000
ZINC 87.500

TASK 2

MG/KG

MG/KG

ANTIMONY < 1.
ARSENIC 1.5
CADMIUM 0.4
LEAD 278

MERCURY < 0.1
SELENIUM < 0.1
THALLIUM < 0.5
TIN 3

TASK 3

MG/KG

OIL AND GREASE

CYANIDE

PHENOLICS

COMMENTS

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"ND/B" - NOT DETECTED DUE TO BLANK

"S" - SAMPLES ANALYZED BY THE STD.
ADDITION METHOD.

WITH A DETECTION LIMIT OF

5. WITH A DETECTION LIMIT OF

6. WITH A DETECTION LIMIT OF

7. INSUFFICIENT SAMPLE ALIQUOT

8. INTERFERENCE

Robert Maxfield for RM
ROBERT MAXFIELD, INORG. BRANCH MANAGER.

A1

INORGANICS ANALYSIS DATA SHEET

LAB NAME VERSAR INC.
LAB SAMPLE # 9904

CASE 1569
QC REPORT 58

PROJECT-TASK 793.0000
BATCH NO. 58

TASK 1

MG/KG

MG/KG

ALUMINUM 2420.000
BARIUM 15.000
BERYLLIUM < 0.250
BORON < 5.000
CHROMIUM 4.500
COBALT < 2.500
COPPER 30.000

IRON 3850.000
MANGANESE 101.000
NICKEL 8.000
SILVER < 0.500
VANADIUM 40.000
ZINC 42.500

TASK 2

MG/KG

MG/KG

ANTIMONY < 1
ARSENIC 1.5
CADMIUM 0.2
LEAD 144

MERCURY < 0.1
SELENIUM < 0.1
THALLIUM < 0.5
TIN 3

TASK 3

MG/KG

OIL AND GREASE

CYANIDE

PHENOLICS

COMMENTS

C" - BLANK CORRECTED CONC.

ND/B" - NOT DETECTED DUE TO BLANK

S" - SAMPLES ANALYZED BY THE STD.
ADDITION METHOD.

WITH A DETECTION LIMIT OF

5. WITH A DETECTION LIMIT OF

6. WITH A DETECTION LIMIT OF

7. INSUFFICIENT SAMPLE ALIQUOT

8. INTERFERENCE

W. Maxfield for R.M.
ROBERT MAXFIELD, INORG. BRANCH MANAGER.

12/12/83

SAMPLE MA 8962

Field/Blau

C4

INORGANICS ANALYSIS DATA SHEET

LAB NAME VERSAR INC.

LAB SAMPLE # 9908

CASE 1569

QC REPORT 58

PROJECT-TASK 793.0000

BATCH NO. 58

TASK 1

MG/KG

MG/KG

ALUMINUM 4310.000
BARIUM 10.000
BERYLLIUM < 0.250
BORON < 5.000
CHROMIUM 5.500
COBALT < 2.500
COPPER 5.000

IRON 4080.000
MANGANESE 42.000
NICKEL 4.000
SILVER < 0.500
VANADIUM < 10.000
ZINC 8.500

TASK 2

MG/KG

MG/KG

ANTIMONY < 1.
ARSENIC 4.5
CADMIUM < 0.05
LEAD 4.8 "S" *

MERCURY < 0.1
SELENIUM < 0.1 "S"
THALLIUM < 0.5
TIN < 1. "S"

TASK 3

MG/KG

OIL AND GREASE

CYANIDE

PHENOLICS

* Not a true std additions procedure as defined in EPA manual
- unspiked sample value = 3.0 with 68% recovery on spiked portion

COMMENTS

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"S" - SAMPLES ANALYZED BY THE STD.
ADDITION METHOD.

WITH A DETECTION LIMIT OF

5. WITH A DETECTION LIMIT OF

6. WITH A DETECTION LIMIT OF

7. INSUFFICIENT SAMPLE ALIQUOT

8. INTERFERENCE

William for RM
ROBERT MAXFIELD, INORG. BRANCH MANAGER.

INORGANICS ANALYSIS DATA SHEET

LAB NAME VERSAR INC.
LAB SAMPLE # 9909 9910

CASE 1569
QC REPORT 58

PROJECT-TASK 793.0000
BATCH NO. 58

TASK 1

	UG/L		UG/L
ALUMINUM	200.	IRON	500.
BARIUM	< 100.	MANGANESE	30.
BERYLLIUM	< 5.	NICKEL	< 40.
BORON	700.	SILVER	< 10.
CHROMIUM	< 10.	VANADIUM	< 200.
COBALT	< 50.	ZINC	70.
COPPER	< 50.		

TASK 2

	UG/L		UG/L
ANTIMONY	< 20.	MERCURY	< 0.2
ARSENIC	< 10.	SELENIUM	< 2. "S"
CADMIUM	< 1.	THALLIUM	< 10. "S"
LEAD	* 75. "S" F	TIN	— S

TASK 3
UG/L

OIL AND GREASE	—
CYANIDE	—
PHENOLICS	—

on QC sheet, reported
< 20, with recovery of 64%
for spike

* On QC sheet, reported value of 52., which was adjusted for
spike recovery. - This "std additions" technique
is not a true std additions method as EPA manual

- COMMENTS defines it.
- "C" - BLANK CORRECTED CONC.
 - "ND/B" - NOT DETECTED DUE TO BLANK
 - "S" - SAMPLES ANALYZED BY THE STD. ADDITION METHOD.
 - WITH A DETECTION LIMIT OF
 - 5. WITH A DETECTION LIMIT OF
 - 6. WITH A DETECTION LIMIT OF
 - 7. INSUFFICIENT SAMPLE ALIQUOT
 - 8. INTERFERENCE

_____ WJN/ven for R.M.
ROBERT MAXFIELD, INORG. BRANCH MANAGER.

APPENDIX C

APPENDIX C

FILE COPY

02039

COST CENTER:		REM/FIT ZONE CONTRACT TECHNICAL DIRECTIVE DOCUMENT (TDD)			2. NO.:	
ACCOUNT NO.:					F1-8302-01	
3. PRIORITY:		4. ESTIMATE OF TECHNICAL HOURS:	5. EPA SITE ID:	6. COMPLETION DATE:	7. REFERENCE INFO.:	
<input checked="" type="checkbox"/> HIGH <input type="checkbox"/> MEDIUM <input type="checkbox"/> LOW		100	MAD 980731335	4-29-83	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO <input checked="" type="checkbox"/> ATTACHED <input type="checkbox"/> PICK UP	
		4A. ESTIMATE OF SUBCONTRACT COST:	5A. EPA SITE NAME:			
			New Bedford Harbor			
8. GENERAL TASK DESCRIPTION: <u>Site inspections of 3 facilities, Develop a property Map</u>						
9. SPECIFIC ELEMENTS:					10. INTERIM DEADLINES:	
1. Sampling and analysis at Acushnet Process Co.						
2. Sampling and analysis at New Bedford Gas and Edison Light Co.						
3. Sampling and analysis at conrail yard, New Bedford						
4. Map shoreline industrial properties in New Bedford, Acushnet and fairhaven. list properties owners from 1940 to present.						
DESIGNED REPORT FORM: <input type="checkbox"/> FORMAL REPORT <input type="checkbox"/> LETTER REPORT <input type="checkbox"/> BRIEFING <input type="checkbox"/>						
11. OTHER (SPECIFY):						
12. COMMENTS: <u>Coordinate with Gerry Sotolango (223-5775)</u>						
13. AUTHORIZING RPO: <u>Donald R. Smith</u> (SIGNATURE)					14. DATE: <u>2-14-83</u>	
15. RECEIVED BY: <u>Paul F. Clay</u> (CONTRACTOR RPM SIGNATURE) <input checked="" type="checkbox"/> ACCEPTED <input type="checkbox"/> ACCEPTED WITH EXCEPTIONS <input type="checkbox"/> REJECTED					16. DATE: <u>2/14/83</u>	

Sheet 1 White - FITL Copy
Sheet 2 Canary - DPO Copy

Sheet 3
Sheet 4

Pink - Contracting Officer's Copy (Washington, D. C.)
Goldenrod - Project Officer's Copy (Washington, D. C.)